PROFILE OF HIV PATIENTS WITH OPPORTUNISTIC INFECTIONS ATTENDING ANTIRETROVIRAL THERAPY CENTRE AND GOVERNMENT RAJAJI HOSPITAL, MADURAI

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CERTIFICATE

This is to certify that this dissertation titled **"PROFILE OF HIV PATIENTS WITH OPPORTUNISTIC INFECTIONS ATTENDING ANTIRETROVIRAL THERAPY CENTRE AND GOVERNMENT RAJAJI HOSPITAL, MADURAI "** submitted by **Dr.VIPINDAS.C** to the faculty of General Medicine, The Tamilnadu Dr. M.G.R. Medical University, Chennai in partial fulfillment of the requirement for the award of MD degree Branch I (General Medicine) is a bonafide research work carried out by him under our direct supervision and guidance.

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I, **Dr. VIPINDAS.C** solemnly declare that the dissertation titled **"PROFILE OF HIV PATIENTS WITH OPPORTUNISTIC INFECTIONS ATTENDING ANTIRETROVIRAL THERAPY CENTRE AND GOVERNMENT RAJAJI HOSPITAL, MADURAI "** has been prepared by me.

This is submitted to the Tamil Nadu Dr. M.G.R. Medical University, Chennai, in partial fulfillment of the regulations for the award of MD Degree Branch I (General Medicine).

It was not submitted to the award of any degree/ diploma to any University either in part or in full form previously.

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CONTENTS

Introduction

AIDS, the Acquired Immuno Deficiency Syndrome, is a fatal illness caused by a retrovirus, HIV virus .It slowly breaks down the body's immunity thereby making the body vulnerable to various opportunistic infections.

In the year 2006, there were about 40 million total people living with HIV / AIDS of which 37 million were adults and 2.5 million were under 15 years. In the same year people newly infected with HIV infections were total 5 million of which adults were 4.2 million and children accounted for 7 lakhs cases. There were around 3 million deaths attributable to HIV /AIDS of which adults comprised 2.5 million and children below 15 years 5 lakhs .(1)

India's epidemic seems to be marked by heterogeneity. The epidemic shifts from highest risk group (commercial sex workers, homosexual men, drug abusers) to bridge population (clients of commercial sex workers and partners of drug abusers).The trend indicates that HIV infection is spreading in two ways –urban to rural areas and from individuals practicing high risk behavior to general population(2).

HIV infection is complicated by various opportunistic infections such as Tuberculosis, candidiasis, herpes zoster, Pneumocystis carinii pneumonia, cytomegalovirus disease etc. In this study, we evaluate the clinical profile of patients with opportunistic infections, modes of transmission, correlation with CD4 counts, symptoms and signs and various clinical presentations of opportunistic infections in a tertiary referral centre.

Aims & Objectives

1. To study the frequency of various opportunistic infections in HIV positive patients in GRH and ART centre, Madurai.

2. To study the clinical profile of various opportunistic infections in HIV positive cases prior to the start of antiretroviral therapy.

Review of Literature

WHO CLINICAL CASE DEFINITION OF AIDS

In places where diagnostic resources are limited AIDS is defined by the existence of at least 2 major signs and 1 minor sign as below in the absence of other known cause of immunosuppression

Major signs - (a) Weight loss >10% of the body weight.

(b) Chronic diarrhoea, continuous or intermittent of 1 month duration.

(c) Fever, continuous or intermittent, of 1month duration.

Minor signs - (a) Persistent cough >1 month

(b) Recurrent zoster.

(c) Oropharyngeal candidiasis.

(d)Generalized pruritic reaction.

(e) Generalized Lymphadenopathy.

(f) Chronic progressive and disseminated herpetic infection.

CLINICAL SPECTRUM OF SOME IMPORTANT PATHOGENS IN HIV

1. Mycobacterium tuberculosis (7, 54, 55)

Pulmonary Koch's	Lower lobe infiltrates ,miliary Koch's ,hilar lymphadenopathy and MDR tuberculosis
Extra-pulmonary Koch's	Brain abscess, pericardial and pleural effusion ,visceral lymphadenitis , peritonitis , meningitis and tuberculoma
2.Pneumococcus	Pneumonia ,bacteraemia ,sinusitis ,meningitis
3.Staphylococcus aureus	Pyomyositis ,septicemia ,pneumonia
4.Salomella typhii	Septicemia and typhoid
5.Salmonella typhimurium	Fever and diarrhoea
6.Shigella	Diarrhoea and bacteraemia
7.Campylobacter	Bloody diarrhoea
8.Bacillus angiomatosis(56)	Erythematous papules ,lymphadenopathy

9.Pneumocystis carinii	Pneumonia ,otitis ,chorioretinitis ,necrotizing vascultitis, bone marrow hypoplasia ,ascitis ,thyroiditis & lymphadenitis
10.Candida	Vaginal ,oral ,tracheal, esophageal candidiasis
11. Cryptococcus neoformans(57,58,59)	Meningitis , pneumonitis ,fungaemia (60)and prostatitis
12. Histoplasma capsulatum	Lung infections and disseminated infections, bone marrow suppression ,hepatosplenomegaly ,lymphadenopathy, Cutaneous histoplasmosis
13. Cytomegalovirus	Retinitis ,oesophagitis ,colitis ,ascending myelitis ,hepatitis and encephalitis
14.Herpes simplex virus(61)	Herpes labialis and genitalis, proctitis oesophagitis, whitlow. PORN ,encephalitis(62)
14.Varicella zoster virus	Herpes zoster
15. Epstein-Barr virus(61)	Oral hairy leucoplakia
16. JC virus	Progressive multifocal leukoencephalopathy

17.Human Papilloma virus	Warts
18.Hepatitis virus	Viral Hepatitis
19.Toxoplasma	Necrotizing encephalitis ,chorioretinitis , pneumonitis ,peritonitis ,orchitis ,myocarditis
20.Cryptosporidiosis	Enterocolitis ,cholangitis and cholecystits
21.Microspora ,Isospora , Giardia	Diarrhoea
22. Entamoeba histolytica	Diarrhoea ,hepatic abscess
23.Acanthamoeba	Skin infections

There are various international and India based studies on the clinical profile of various opportunistic infections. Some of them are described as below:

INTERNATIONAL STUDIES

JM Llibre et al (66) in the year 1992 studied clinical and laboratory characteristics in 73 HIV-infected patients with TB admitted over a period of 6 years to determine the risk stratification for

dissemination of tuberculosis in HIV-infected patients. In their study, TB was extra pulmonary in 46.6 per cent of patients in whom it was their first opportunistic infection, and in 46.7 per cent of patients with previously diagnosed AIDS. Also, TB was frequently associated with other opportunistic infections, particularly esophageal candidiasis. They concluded that extra pulmonary TB was as common in early HIV infection as in patients with established AIDS. The location of TB and its dissemination were not significantly linked to a more advanced CDC stage of HIV infection or a more profound fall in CD4 count.

M Whiteman et al (69) in 1995 performed a study to characterize the radiographic findings on neuroimaging of 25 human immunodeficiency virus (HIV)- seropositive patients with proved central nervous system tuberculosis and to correlate those findings with clinical data. They included twenty-five HIV-seropositive patients with central nervous system tuberculosis, and did their imaging studies (CT and, in some cases, MR).They also studied the CD4 counts and chest x-ray findings. They found 9 (36%) of 25 patients demonstrated meningeal enhancement. Eleven (44%) of 25 demonstrated enhancing parenchymal lesions; 6 patients had Tuberculomata, and 5 had tuberculous abscesses.

Communicating hydrocephalus was present in 8 (32%) of 25, and infarction was seen in 9 (36%) of 25. they also found 15 of 23 chest x-rays were suggestive of pulmonary tuberculosis. Mean CD4 count was 162. 9 (38%) of 24 patients had a history of pulmonary tuberculosis, and 5 (21%) of 24 had no history of tuberculosis or any other opportunistic infection. Overall mortality was 79%. They concluded that Central nervous system tuberculosis had a very high mortality among HIV-infected patients. They showed radiographic clues include multiloculated abscess, cisternal enhancement, basal ganglia infarction, and communicating hydrocephalus, which are not findings associated with the more commonly encountered central nervous system lymphoma or Toxoplasma encephalitis.. In patients with suspected central nervous system tuberculosis, chest x-ray may provide additional support for the diagnosis of tuberculosis.

Durden FM et al (70) in 1997 showed that opportunistic fungal infections are commonly encountered in the acquired immunodeficiency syndrome (AIDS) patient population. Fungal infections in the patient infected with the human immunodeficiency virus (HIV) are a major cause of morbidity and mortality. The yeasts Candida and Cryptococcus neoformans, the dimorphic fungi Histoplasma capsulatum and Sporothrix

schenckii, and the dermatophyte fungi are the most common pathogenic fungi in patients infected with HIV

S. Uthayakumar et al (72) in 1997 performed a cross-sectional study of human immunodeficiency virus (HIV) positive patients who attended the HIV clinic in Brighton, over a 4-month period to describe the prevalence and severity of skin manifestations in HIV-positive patients and to elucidate their association with the peripheral CD4 cell count and with the HIV disease stage. The most frequent problem was infection followed by dermatoses, pruritus and malignancy. In their study the most frequent condition was seborrheic eczema followed by tinea and xerosis.

In the year 1998 **Garcia Ordonez MA et al** (73) did a prospective study to show the incidence and clinical spectrum of tuberculosis in the metropolitan area of Malaga (Spain). They confirmed the diagnosis microbiologically in 106 cases (76.8%), histologically in 14 cases (10.1%). The remaining 18 cases (13.1%) they diagnosed clinically.

Myoung-don Oh (74) et al in 1999 reviewed the medical records of 173 HIV-infected patients of last 13 years. They found that most patients (85%) were male, and 107 (62%) were infected by heterosexual contacts. CD4+ lymphocyte counts at presentation were <200/ L in 27% of the patients. Tuberculosis was the most frequent opportunistic infection

(25% of patients), followed by candidiasis (21%), herpes zoster (20%), Pneumocystis carinii pneumonia (10%), cytomegalovirus disease (9.8%). They found no cases of toxoplasmosis in their study.

Maurizio Ravera et al (75) in 1999 did their study of 1 year in 320 consecutive AIDS patients who attended Gastroenterology Department of Hoima Hospital in Uganda.. They concluded that esophageal candidiasis could be suspected if oral thrush is present, especially when esophageal symptoms are associated.

Kathleen Welch et al (77) in the year 2002 carried out a cross-sectional study in 699 patients during the period of 5 years. In their study, majority of the patients were males and more than 35 years of age. In their study, the six AIDS-defining conditions with the highest percentages of first-time acquisition in the last 12 months of life were HIV dementia (91.8%), progressive multifocal leukoencephalopathy (PML) (91.7%), wasting (90.9%), Mycobacterium avium complex infection (MAC) (80.0%), lymphoma (78.6%), and cytomegalovirus infection (CMV) (78.1%). 40% of the patients were diagnosed with at least one of these six conditions 12 months before death. They concluded that AIDS-defining conditions continue to have an impact on mortality, especially the

neurologic conditions and wasting. However, other conditions, such as renal and hepatic disease, are becoming important causes of mortality.

Senya C et al (78) in 2003 reviewed 381 HIV-infected patients admitted to a public hospital in Phnom Penh, Cambodia over last 6 months. They found that the in-hospital mortality rate was 43.6%. Approximately 50% of patients had two or more concurrent illnesses. Very advanced HIV disease was common in their study, with CD4 cell counts below 10 cells/mm cube in 43.2%. Only 28.3% of the patients had documentation of their HIV infection prior to hospitalization. Chronic diarrhoea was the most frequent opportunistic illness (41.2%), followed by tuberculosis (26%), cryptococcal meningitis (12.6%), Pneumocystis carinii pneumonia (8.4%), and encephalitis (4.7%). Chronic diarrhoea and tuberculosis were the most important opportunistic infections observed in HIV-infected hospitalized patients in Cambodia.

Robles P et al (79) in the year 2003 did a retrospective analysis of 878 cases of culture-positive TB to study the spectrum of clinical tuberculosis in the AIDS era. They found that the clinical forms of TB observed were pulmonary (52.5%), generalized (17.8%), pleural (11.8%), lymphatic (8%), genitourinary (7.5%), osteoarticular (4%), meningeal

(1.8%) and others (4.6%). Overall 25.5% of patients with TB were co infected.

Okodua et al (80) in 2004 studied the age and sex distribution of intestinal parasitic infection among 215 subjects with mean age of 32 years, comprising of 35 HIV-seropositive and 180 HIV seronegative HIV infected subjects in Abeokuta, Nigeria. They found that overall parasitic infection rate was 28.4%. Infection rate among HIV seropositive subjects (42.9%) was statistically higher than that among HIV seronegative subjects (25.6%) ($P<0.05$). Although helminths infection rate (31.4%) was higher than that of protozoa (20%) among HIV-seropositive subject, the difference was not statistically significant ($P>0.05$).They also found that there was no statistically significant difference in the parasitic infection between HIV-seropositive males and females and among the various age groups ($P>0.05$).

C. M. Schutte et al (82) in 2004 studied over a period of 4-year study, 141 patients with meningitis. Of these, 44 were HIV-positive (31%), with TB meningitis occurring in 16 (36%), cryptococcal meningitis in 22 (50%) and acute bacterial meningitis in three (7%). In the first 2 years of the study, 14% of patients were HIV positive; this figure rose to 44% in the 3rd year, and 57% in the final year. The spectrum of

meningitis also changed: bacterial meningitis remained relatively stable at about 25% of the total; TB meningitis almost doubled from 16% in the 1st year to 31% in the last year of the study; viral meningitis initially occurred in 8% of patients and later in 3% of cases, while cryptococcal meningitis showed the most significant increase from 6% of cases to 31 and 26% respectively in the last 2 years of the study.

Lee MP et al (83) in year 2005 performed a study to evaluate the impact of HIV infection on the clinical presentation of tuberculosis. They found that majority were male (88.3%) and the most common transmission category was heterosexual contact (80%). Most were in the advanced stage of HIV infection; 93% had CD4 cell count less than 200/mm ^{3}. Concerning the site of tuberculosis involvement, they found that 37% had pulmonary involvement alone, 13% had extra pulmonary disease involving one single site, 50% had both pulmonary and extra pulmonary involvement. Fifteen (25%) patients also met the criteria of disseminated tuberculosis, who had a significantly lower mean CD4 cell count than those with pulmonary involvement alone. In their study, Chest radiographs comprised a wide spectrum of manifestations. A considerable proportion had primary pulmonary tuberculosis pattern (38%) and normal radiographs (8.5%).

Chien-Ching Hung et al (84) in the year 2005 conducted a prospective cohort study of Candida colonization and its risk factors over a period of 3 years. They found that the majority (91%) of the patients were men. The $CD4^+$ counts were available for 599 patients, and the average $CD4^+$ count was 279.5 cells/mm^3. Only 15.3% of the patients had $CD4^+$ counts greater than 500 cells/mm^3, while 43.9% of the patients had $CD4^+$ counts less than 200 cells/mm^3 and 13% of the patients had $CD4^+$ counts less than 50 cells/mm. More than 50% of the patients were colonized with Candida species, and 12% developed symptomatic candidiasis. Patients colonized with fluconazole-resistant strains of Candida species had a higher prevalence of candidiasis than those colonized with susceptible strains. They found that antibiotic treatment and lower CD4+ counts (<200 cells/mm3) increased the rate of oropharyngeal candidiasis in HIV-infected patients, while antiretroviral therapy protected patients from the development of candidiasis.

A Tsantes, et al (85) in 2005 studied 6521 cases with the objective to evaluate the current trends in HIV transmission in Greece. They found that among them, 5241 (80.37%) were men and 1242 (19.04%) were women and the gender was not reported for 38 cases (0.59%).They also found that homosexual men comprised the most frequent category, with 2944 (45.1%) cases reported. Men and women who had been infected through heterosexual

contact made up 1214 (18.6%) cases and 37.1% of them .Heterosexual contact was the only transmission category where women predominated (64.74%). They classified high proportion of cases (27.1%) to have “undetermined” mode of transmission.

Ferreira MS. et al (86) in 2005 showed that protozoa are among the most important pathogens that can cause infection in immunocompromised patients Among the protozoa that most commonly cause disease in immunocompromised individuals are Toxoplasma gondii, Trypanosoma cruzi, Cryptosporidium parvum, Isospora belli, Cyclospora cayetanensis and microsporidia; the former two cause severe encephalitis and myocarditis, and the others cause gastrointestinal infections.

César Cárcamo et al (87) in 2005 conducted a case-control study in Lima, Peru of 147 HIV-1infected case subjects with persistent diarrhea and 147 HIV-1 infected control subjects without diarrhea to find out the etiologies and manifestations of persistent diarrhea in adults with HIV-1 infection. They obtained clinical, demographic, and exposure data, CD4 lymphocyte counts, and stool samples for detection of enteric parasitic and bacterial pathogens and rotavirus. They found that one or more enteric pathogen was identified in 55% of case subjects and 21% of control subjects .The median CD4 lymphocyte count was highest with pathogen-free diarrhea

and lowest with Cryptosporidium infection. Cryptosporidium species (the most frequent pathogen), Giardia lamblia, Aeromonas species, Campylobacter species, and rotavirus were all significantly associated with diarrhea. Bacterial pathogens were significantly associated with G. lamblia and rotavirus infection. Of the bacterial pathogens Aeromonas, Campylobacter, Salmonella, and Vibrio species and enterotoxigenic Escherichia coli were common. They also found that several enteric pathogens were associated with diarrhea in HIV-1infected case subjects in Peru, especially among those who were heterosexual.

Guk SM et al (89) in 2005 studied over a period of 8 years the prevalence of the parasitic infections in 105 HIV-infected patients who visited Seoul National University Hospital. They found that 33 (31.4%) of the 105 were found to have parasitic infections. The percentage of various opportunistic pathogens were- Cryptosporidium parvum (10.5%; 7/67), Isospora belli (7.5%; 5/67), Clonorchis sinensis (3.0%; 2/67), Giardia lamblia (1.5%; 1/67), Gymnophalloides seoi (1.5%; 1/67), and Pneumocystis carinii (28.3%; 17/60). They found from the hospital records of the 11 intestinal parasite-infected patients that all suffered from diarrhea. From their study, they concluded that parasitic infections were

important clinical complications in HIV-infected patients in the Republic of Korea.

Brouwer KC et al (91) in 2006 aimed to study the estimate of number of men and women aged 15 to 49 years infected with HIV in Tijuana. They obtained the gender and age-specific estimates of the Tijuana population from Mexican census and screened a total of 686,600 men and women in Tijuana, aged 15 to 49 years. .They found that the number of infected persons ranged from 1,803 to 5,472 .The majority of these persons were men (>70%). The largest number of infected persons were MSM, men having sex with men, (N = 1,146 to 3,300) and IDUs (N = 147 to 650). They concluded that up to one in every 125 persons aged 15-49 years in Tijuana was HIV-infected.

Richard D. Moore et al (93) in 2006 did a retrospective and prospective observational study in 1246 HIV-infected patients with CD4+ counts of 300 cells/mm cube or less. They found that the most common opportunistic disease was Candida esophagitis, which had an incidence of 13.3 events per 100 person-years. Pneumocystis carinii pneumonia, Mycobacterium avium complex bacteremia, cytomegalovirus, and the acquired immunodeficiency syndrome dementia complex occurred at rates of 5 to 9 events per 100 person-years. Toxoplasmosis, cryptococcal

meningitis, herpes zoster, the wasting syndrome, and Kaposi sarcoma occurred at rates of about 2 to 4 events per 100 person-years.

INDIA BASED STUDIES

Ponniah P et al (94**)** in 1993 studied in 919 HIV positive individuals the pattern of infection. They found that out of 919 HIV positive individuals 535 were had one or other infection. Tuberculosis in 71 (Pulmonary T.B. 15; Neuro T.B. 29 and other forms: 27), Opportunistic CNS infection in 17 (Cryptococcal meningitis: 11; CNS Toxoplasmosis: 4 and pyogenic cerebral abscess: 2), Cervical intraepithelial neoplasia in 42, Candidiasis in 43 (Oral: 38; Perianal Cutaneous: 8; Generalised cutaneous: 2 and disseminated: 2), STD and associated diseases in 340 (Past STD: 88; Multiple STD: 56; GUD: 87; Warts: 19; Syphilis: 69; Granuloma inguinale: 8 + unclassified: 13) and Lepromatous leprosy in 2 cases. 20 cases had diarrhoea and it was due to cryptosporidiosis in majority.

Patel AK et al (95) in the year 1994 studied 31 pts who were admitted with high risk behavior and clinical features related to HIV disease to explore the clinical presentation of HIV disease in State of Gujarat, India. CD4 & CD8 counts were not done as facility was not

available. Total 31 patients, 14 male and 17 female with M:F = 0.824:1. They found that the mode of transmission were sexual route 18 (58.07%) patients (Heterosexual 17 (54.84%), Homosexual 1 (3.23%), Parenteral route 13 (41.94%) patients (Blood transfusion 13 (41.94), I.V. drug abusers Nil, infected needle injury Nil), and vertical transmission Nil. The common modes of presentation were fever more than 1 month (80.65%) weight loss more than 10% of body weight (77.42%). Diarrhoea more than 1 month (41.94%), Oropharyngeal candidiasis (41.94%), Pulmonary and extra pulmonary tuberculosis (25.81%), Recurrent Pyogenic infections (12.90%), generalized Lymphadenopathy (12.90%), Pneumocystis Carinii pneumonia (12.90%). AIDS Dementia Complex, (9.68%) and Recurrent Herpes Zoster (9.68%).Majority were male (88.3%) and the most common transmission category was heterosexual contact (80%). Most were in the advanced stage of HIV infection; 93% had CD4 cell count less than 200/mm 3. Concerning the site of tuberculosis involvement, they found that 37% had pulmonary involvement alone, 13% had extra pulmonary disease involving one single site, and 50% had both pulmonary and extra pulmonary involvement. 15(25%) patients also met the criteria of disseminated tuberculosis, who had a significantly lower mean CD4 cell count than those with pulmonary

involvement alone (mean 40 vs. 102; P = 0.048). Chest radiographs comprised a wide spectrum of manifestations. In their study , a considerable proportion had primary pulmonary tuberculosis pattern (38%) and normal radiographs (8.5%).

Kumarasamy N et al (96) in the year 1995 did a retrospective case note review of 100 AIDS. They found that of these 100 patients, 94% had a history of heterosexual HIV transmission and 68% were male. 58% of them were 21-30 years old. The male/female ratio was 2:1. 94% had acquired HIV via heterosexual intercourse. 81% of all patients had multiple sex partners and unprotected penetrative sex. Around 66% had more than one opportunistic infection. The most common opportunistic infection was tuberculosis (61%), especially pulmonary tuberculosis (46%), followed by oral candidiasis (41%), Cryptosporidial diarrhea (16%), and fungal infection of the skin (16%).

Biswas Jyotirmay et al (100) in 1999 studied the ophthalmic manifestations of human immunodeficiency virus (HIV) infection in India in 70 patients. They found that 32 (45.7%) had ocular lesions, the most common being cytomegalovirus (CMV) retinitis (21.4%). Other lesions included cotton-wool spots (12.8%), chorioretinitis (5.7%), endogenous

endophthalmitis (8.5%), and anterior uveitis (4.2%), and Molluscum contagiosum (1.4%). The most common systemic infection was pulmonary tuberculosis (50%). The others were oral candidiasis (41.4%), Pneumocystitis carinii pneumonia (11.4%), HIV enteropathy (12.8%) and toxoplasmosis (4.2%).They concluded that ocular lesions in HIV patients in India are less common than in USA and Africa. Unlike HIV patients in USA, the most common ocular lesion among HIV patients in India is CMV retinitis and not the cotton wool spots.

P .Satishchandra et al(101) in 1999 studied 100 patients including 95 males and 5 females with various neurological disorders associated with HIV infection for 7 years.80 patients belonged to group I associated with opportunistic neuroinfections and 20 to group II , non infectious neurological disorders. They found that in group I, Cryptococcal meningitis either alone (n-31) or associated with TB meningitis (n-6) was the most common (46.3 %) followed by neuro tuberculosis either alone (n-24) or with cerebral toxoplasmosis (n-4) accounted for 35 %. Other opportunistic neuroinfections included herpes zoster, pyogenic meningitis and neurosyphilis. In group II (19 male and 1 female mean age of 32 .6 years) 2 patients had cortical dementia, 3 acute brainstem involvement, 2 epilepsy and 1 had features of PML.

N. Usha Rani et al (103) in 2000 studied 120 patients with HIV infection at the Govt. Hospital for Chest and Communicable Diseases, Visakhapatnam over 1year.Out of these, 23 had PCP as per CDC diagnostic guidelines and they tested HIV positive. Of the 23 cases, 18 (78%) were males, 11 (47%) belonged to the age group of 21-30 years and 40% were truckers or manual labourer. All males gave a history of promiscuous behavior and casual sex. One female had undergone blood transfusion.. Retrosternal discomfort was seen in 13%. Most common coexisting conditions were oral candidiasis, hairycell leukoplakia and oral ulcers (78%). The most common dermatological manifestation was seborrhoeic dermatitis (30%). Diarrhoea and mild dehydration were associated in 35%. Clinical examination of the respiratory system in a majority was normal, some showed fine basal crackles with or with out rhonchi. Exercise Oxygen Saturation (EOS) measurements revealed that 74% had initial SPO2more than90%, with a mean drop of 4% with exercise, and 26% had initial SPO2less than 90% with a mean drop of 11 % with exercise. Mean drop was more in cases with initial SPO2<90%. Chest X-ray examination showed that 73% had bilateral lower zone or mid and lower zone interstitial shadows and 18% had interstitial and alveolar shadows. High resolution CT was done in 2 patients; both

showed diffused ground glass opacities. Induced sputum test profile in PCP was done. Pneumocystis Carinii cysts were demonstrated in 1 out of 6 (16%) cases by Giemsa staining. They estimated Serum LDH level in 13 cases and found increased levels in 92% of the cases (more than 4601.U./ lit), while 3 cases showed levels more than 1000 I.U. / lit. Montoux test done with 5 T.U. PPD showed that 65% of the cases were anergic

Kothari K et al (104) in 2001 studied in 30 HIV patients the clinical presentation and spectrum of systemic involvement and opportunistic infections in AIDS patients. They found that out of 30, 25 patients were male and 5 female and had mean age of 32.76+/-8.14 years (range 23-55 years). Ninety percent were in 20-40 years age group. 40% were related to transport services, while 43% had migrated to other areas. Sexual mode of transmission was seen in 21 subjects (70%) (20 males and one female), of which 18 were heterosexual and 3 bisexual. Four patients (13%) had history of blood transfusion. The commonest presentation was fever in 96%. Significant weight loss (1.5%+/-9.76%) was present in patients having associated Candida infection (n=15). Tubercular disease was seen in 66% and 30% had atypical presentations. They made a presumptive diagnosis of PCP in 10% while 30%were diagnosed to have

cryptococcal infection. In their study, the most common system involved was GIT (70%). AIDS dementia complex was diagnosed in 13% all aged above 35 years. They concluded that occupation and migration were important risk factors for HIV transmission and heterosexual contact is the commonest mode of spread. Amongst infection, tuberculosis and candidiasis were common

Kumar Praveen et al (106) in 2002 found that most of the study patients were manual labourers followed by truck drivers. Sexual (heterosexual) route was found to be the major risk factor for HIV/AIDS. The most common symptom in these patients was cough and expectoration, followed by fever and weight loss. Acid-fast bacilli (AFB) smear positivity was found in 21.4% patients. On chest skiagram, infiltrative lesions were commonly seen in 61.9% patients. Extra-pulmonary tubercular manifestations were seen in 45.6% of HIV/TB cases.

Singh A et al (6) in 2003 concluded that presence of oral candidiasis and weight loss is highly predictive of low DC4 count and can be considered as a marker of HIV disease progression.

M. Vajpayee et al (107) in the year 2003 concluded that tuberculosis was the most frequent OI in the HIV-infected patients

studied, and the major mode of transmission of HIV was by sexual route. The median CD4+ counts observed were lower when compared to other studies.

SK Sharma et al (5) in the year 2004 found that fever (71%) and weight loss (65%) was the commonest presenting symptoms. Heterosexual transmission was the commonest mode of HIV-acquisition. Tuberculosis (TB) was the commonest OI (71%) followed by candidiasis (39.3%), Pneumocystis jiroveci pneumonia (PCP) (7.4%), cryptococcal meningitis and cerebral toxoplasmosis (3.7% each). Most of the cases of TB were disseminated (64%).. Majority of the patients (82.6%) had CD4+ counts <200 cells/µL. Fifty patients (46%) had CD4+ counts <50 cells/µL. Twenty one patients (16%) died during hospital stay. All but one deaths were due to TB (16 patients; 76%) and PCP (4 patients; 19%).They concluded that wide spectrum of disease, including both OIs and non-infectious opportunistic diseases, is seen in hospitalized HIV-infected patients from north India. Tuberculosis remains the most common OI and is the commonest cause of death in these patients.

Udwadia Z. F et al (110) in the year 2005 concluded that PCP is not an uncommon infection in Indians with advanced HIV and that PCP

was the second commonest pulmonary disease after tuberculosis accounting for 32% of

Rajendraprasad S. et al (112) in the year 2005 showed that tuberculosis is one of the commonest opportunistic infections seen among HIV positive patients and active TB is common in Karnataka, India. Sputum negative pulmonary TB is the commonest presentation. Among patients with extra-pulmonary TB, both pleural effusion and tuberculous lymphadenitis were common

Subramanian S et al (113) in 2005 in a 5-year retrospective cohort and 1-year prospective cohort study in a total 105 patients assessed clinical profile, outcomes, and poor prognostic markers in patients with cryptococcal meningitis. The common manifestations at presentation were headache (88%), fever (73%), vomiting (57%), and weight and appetite loss (49%). Seizures and focal neurological deficits were rare (<10%). In their study, where fungal cultures and cryptococcal antigen were positive in all patients and 83% of patients were India-ink positive, the mean CSF WBC count was 107 cells/ml, protein 88.6 mg%, and glucose 48.6 mg%..

V S S Attil (114) et al in 2005 studied all HIV patients attending the infectious disease clinic, Varanasi, India in the time period of 2 years to assess HIV associated tuberculosis in a high tuberculosis prevalence

setting and its status in the clinical case definition of AIDS. They were stratified into three distinct immunological categories depending on their CD4 levels in accordance to Centers for Disease Control (CDC) classification. They found that tuberculosis was the commonest opportunistic disease, seen in 163 patients. Of these, 68 had exclusively pulmonary tuberculosis, 55 extra pulmonary disease, and 40 the disseminated form. Pulmonary and extra pulmonary tuberculosis had low positive predictive value (PPV) (51% and 42%) for CD4 levels of <200 when compared with the disseminated form (specificity 87% and PPV 75%). Among 86 patients with radiological evidence of tuberculosis, typical radiological features of post-primary tuberculosis were present in 60 cases (70%). Other features such as effusion (14 patients, 16%) and miliary shadows (12 patients, 14%) were comparatively rare. They concluded that pulmonary and extra pulmonary forms of tuberculosis should be considered in AIDS defining illness.

Material & Methods

This cross sectional, hospital based study of, clinical profile of opportunistic infections in HIV patients prior to the start of antiretroviral therapy, was carried out at Govt.Rajaji Hospital, Madurai medical college,from June 2005 to June 2007

Approximately 100 patients who were documented HIV positive, who had opportunistic infections and who were admitted to various medicine wards and ART center in Govt.Rajaji Hospital were included in the study.

After fully explaining the procedure their consents were taken and HIV status was confirmed by HIV Elisa test for HIV.

Elisa is considered a standard screening test for HIV and it measures antibodies to all viral proteins. The solid phase has a sensitivity of more than 99.5% and specificity of 98.6%. In titers of 5:1 the test is considered positive, in titers of 3:1 the test is considered negative. Between 3:1 and 5:1 the test is considered indeterminate.

All the patients underwent through a list of questionnaire and detailed clinical examinations as per the proforma.

On the basis of clinical suspicion, a probable diagnosis of opportunistic infections was kept and various lab investigations were done to confirm the diagnosis. This included the following investigations:

1. Hemoglobin

2. ESR

3. Peripheral smear

4. Total and differential leucocytes count

5. CD4 counts

6. LFT, RFT, Blood sugar

Hemoglobin, TLC, DLC were done on coulter counter and ESR was done on Westergren's ESR tube in the department of Pathology. CD 4 counts were done on FACS caliber flowcytometer (Beckton & Dickinson) in the department of Microbiology.

7. Serum for serologies like toxoplasma and cytomegalovirus virus.

8. Other body fluid samples like –Sputum for gram stain, ZN stain, Giemsa stain, Silver methanamine and culture sensitivity.

9. Stool for screening under microscope for helminthic eggs, cysts, protozoa, trophozoites, pus cells and fungal elements.

10. CSF samples for microscopy for total and differential counts and India ink preparation, ZN staining and culture over various media like blood agar, chocolate agar and Mc Conkeys' media.

11. Other fluids that were examined were pleural fluid and ascitic fluid when required.

Other supportive investigations were X ray chest, CT head, USG abdomen and thorax, FNAC from lymph nodes as per the demands of clinical presentation.

Various supportive investigations that were used in conjunction with clinical profile for the confirmation of diagnosis of opportunistic infections are as below.

OPPORTUNISTIC INFECTIONS	**SUPPORTIVE INVESTIGATIONS**
Pulmonary TB	ESR, Montoux, sputum for AFB, X ray chest.
Tuberculous adenitis	ESR, Montoux , sputum for AFB ,X ray chest ,FNAC from lymph nodes
Tuberculous meningitis	ESR, Montoux , sputum for AFB ,X ray chest,CT head, in presence of evidence of

	tuberculosis elsewhere in body.
Cryptococcal meningitis	CT head, CSF for India ink preparation,Negative stain(Nigrosine carbol fuschin stain)
Cryptosporidiosis ,Microspora, Isospora, Strongyloids	Stool examination and special staining(modified ZN stain /Kinyoun stain), wet mount /saline mount or Lugol's iodine mount for helminthic eggs
Toxoplasma	CT head, IgM capture Elisa
Cytomegalo virus	Ophthalmoscopy
Herpes simplex, Herpes zoster, molluscum Contagiosum	Clinical
Candidiasis	Oropharyngeal swab for KOH mounting to see pseudohyphae, upper GI endoscopy
Pneumocystis carinii	X ray chest,sputum for Giemsa stain or Silver methanamine stain
Progressive multifocal leukoencephalopathy	MRI /CT brain

EXCLUSION CRITERIA:

1. Patients of HIV who are already on anti retroviral therapy
2. Patients harboring opportunistic infections who are immunosuppressed because of causes other than HIV.
3. Patients who don’t consent for being included in study.

Results

TABLE 1
Gender Distribution of Cases

Sex	No of cases (n)	Percentage
Male	74	74%
Female	26	26%
Total	100	100

The above table shows gender distribution of male and females harboring various opportunistic infections. There was higher proportion of males, n= 74 (74%) as compared to females, n=26 (26%). The male to female ratio was 2.84:1.

TABLE 2
Age Distribution of Patients

Age group	10-19 yrs	20-29yrs	30-39yrs	40-49 yrs	50-59 yrs	>60yrs	Total(n)
No of cases (n)	3	21	55	15	6	0	100
Percentage	3%	21%	55%	15%	6%	0%	100%

The present study revealed that the maximum number of patients who had opportunistic infections fell in the age group of 30- 39 yrs ,n=55 (55%), followed by the age group 20-29 yrs , n=21 (21%). No patients were found in the age group above 60 yrs and only 3 % of the patients were in the age group of 10-19yrs, n=3.

TABLE 3

Pre marital sexual encounter

No. of cases who have had premarital sex	39 unmarried 23 Married or separated 16
No. of cases who have had no premarital sex	61

In the present study, there were 39 cases who have had premarital sex at one time or the other, where as 61 never had any such encounter.

TABLE 4

Marital status of patients

Marital status	No of cases(n)	Percentage of cases
Married	65	65%
Unmarried	23	23%
Separated	12	12%
Total	100	100%

Of all the cases maximum number of HIV positivity with opportunistic infections were seen in the married group (65 %) n= 65, followed by people who were unmarried (23%), n= 23 and least in those who were separated (12%), n=12

TABLE 5

Status of Extramarital Partners

Status	No of cases (n)	Percentage of cases
None	24	31.16%
Single	12	15.58%
Multiple	41	53.25%
Total	77	100%

The above table depicts that most of the patients enrolled in the study had multiple extramarital sexual partners and accounted for 53.25 %(n=41), followed by those who had no extra marital relations, 31.16 %(n=24).

TABLE 6

Occupation of Patients Presenting With Opportunistic Infections

Occupation	No of cases(n)	Percentage of cases
Labourer	43	43%
Drivers	12	12%
Service men	11	11%
Business men	9	9%
CSWs	4	4%
Housewife	18	18%
School children	3	3%
Total	100	100%

Most of the occupants, who harboured opportunistic infections were labourer (43%), n=43, followed by housewives (18%) n=18. Drivers accounted for 12% (n=12) and school going children for only 3% (n=3) of the total cases.

TABLE 7

Type of exposure

Exposure type	No of cases (n)	Percentage of cases
Heterosexual	94	96%
Homosexual	1	1%
Blood transfusion	3	3%
IV drug abuse	0	0%
Needle stick	0	0%
Materno-fetal/infant	2	2%
Total	100	100%

The above table shows that the heterosexual mode of transmission was the commonest mode of transmission, accounting for 94 %(n=94) of the cases. In the present study, no cases could be attributed to IV drug abuse, or Needle stick. 3% of the cases (n=3) accounted for the transmission due to transfusion of the blood or blood products and 2% to Materno-fetal transmissions.

TABLE 8

Level of education

Level of education	No of cases (n)	Percentage of cases
<10th standard	55	55%
10-12th standard	34	34%
Higher education	11	11%
Total	100	100%

The incidence of opportunistic infections was significantly high (55%), n=55, in patients who were less educated, that is below tenth standard. whereas it was mere 11 %(n=11) in those who were highly educated.

TABLE 9

Clinical symptomatology of opportunistic infections

Symptoms	No of cases (n)	Percentage of cases
Fever	73	73%
Weight loss	71	71%
Diarrhoea	15	15%
Cough	55	55%
Loss of appetite	76	76%
Dysphagia	48	48%
Dyspnoea	47	47%
Tachypnoea	23	23%
Genital lesions	10	10%
Body swelling	12	12%
Rash	0	0%
Headache	29	29%
Convulsions	20	20%
Abdominal pain	15	15%
Abdominal distension	3	3%
Chest pain	26	26%
Visual blurring	16	16%
Vomiting	33	33%
Altered sensorium	18	18%

In the present study as depicted by the table, the most common symptoms at presentation were loss of appetite (76%) n=76, fever (73%) n=73, weight loss (71%) n=71, cough (55%) n=55, where as diarrhea was seen in only 15 %(n= 15) of the cases.

TABLE 10

Duration of Fever

Duration of fever	No. of cases (n)	Percentage of cases
Less than 1 month	4	4%
More than 1 month	69	69%
Absent	27	27%
Total	100	100%

Those patients who were febrile at presentation had history of fever mostly of more than 1 month duration (69 %) n= 69 and only 4 %(n= 4) of the total cases accounted for fever of less than 1 month duration.

TABLE 11

Degree of Weight Loss

Degree of weight loss	No of cases (n)	Percentage of cases
>10% of body weight	46	46%
<10 % of body weight	25	25%
Absent weight loss	29	29%
Total	100	100%

Most of the patients with opportunistic infections at presentation had weight loss more than 10 % of their body weight (46%) n=46 where as in 29 % (n= 29) of the patients there was no history of weight loss.

TABLE 12

Duration of Diarrhoea

Duration of diarrhoea	No of cases (n)	Percentage of cases
>1 month	15	15%
<1 month	0	0%
Absent	85	85%
Total	100	100%

The table above shows that diarrhoea at presentation of opportunistic infections had a duration of >1 month in 15 %(n=15) of the cases.

TABLE 13

Duration of Cough

Duration of cough	No of cases (n)	Percentage of cases
>1 month	53	53%
<1 month	2	2%
Absent	45	45%
Total	100	100%

The table depicts the presence of cough of more than 1 month duration in 53 %(n=53) of the cases at presentation.

TABLE 14

Relevant past histories

Past history	Number of cases (n)	Percentage of cases
Sexually transmitted diseases (STDs)	21	21%
Tuberculosis	28	28%
Hematological disorder	03	03%
Others (DM,CRF,CTDs)	00	00%
Not contributory	48	48%
Total	100	100%

In the present study there were no significant relevant associated past history (48%). Associated history of Tuberculosis was present in 28 %(n=28) of the cases followed by that of STDs in 21 %(n=21) of cases.

TABLE 15

Associated history of drug addiction

Drug addiction	No of cases (n)	Percentage of cases
Alcohol	19	19%
Tobacco(smoking /chewing)	15	15%
Other substance of abuse	07	07%
Multiple addictions	33	33%
No addictions	26	26%
Total	100	100%

The table no 16, shows that in 33 % (n=33) of the cases there was history of multiple addictions whereas in 19 %(n=19) of the cases there was history of addiction to alcohol and in 15 % (n=15) of the cases addiction to tobacco was present.

TABLE 16

Relevant Family History

Family history	No of cases(n)	Percentage of cases
Contact with case of TB	9	9%
HIV positivity in spouse	19	19%
Not contributory	72	72%
Total	100	100%

The above table shows that 19 %(n=19) of the patients had history of HIV positivity in their spouse and in 72 %(n=72) of the cases the history was not contributory.

TABLE 17

Signs on General Examination

Important Signs	No of cases	Percentage of cases
Emaciated built	73	73%
Fever	60	60%
Tachycardia	94	94%
Tachypnoea	62	62%
Pallor	76	76%
Icterus	03	03%
Cyanosis	16	16%
Clubbing	09	09%
Edema	05	05 %
Lymphadenopathy	13	13%
Genitals	10	10%
Skin lesions	08	08%
Thrush	45	45 %

Above table depicts that the 3 most common findings on general examination were tachycardia (94%) n= 94, emaciation (73%) n= 73 and pallor (76%) n=76.

TABLE 18

Important systemic examination findings

Systems	No. of cases (n)	Percentage of cases
Respiratory	56	56%
1. consolidation	44	78.57%(0f 56 cases)
2. pleural effusion	06	10.71%
3. fibrosis	05	08.92%
4. cavity	01	01.78%
Cardiovascular	06	06 %
1.distant heart sounds	05	83.33%(of 06cases)
2.gallop rhythm	01	16.66%
Abdomen	05	05%
1. free fluid	02	40% (of 5 cases)
2. doughy	00	00%
3. palpable lump	03	60%
Central nervous system	26	26%
1. meningitis	19	73.06% (of 26 cases)
2. focal deficit	07	26.94%
Genitals	10	10%

1.vesicles	01	10% (of 10 cases)
2.ulcers	00	00%
3.papules	06	60%
4.warts	00	00%
5.vulvovaginal thrush	03	30%
Skin	15	15%
1.tinea	00	00%
2.herpes zoster	04	26.66%
3.molluscum	06	40%
4.scabies	03	20%
5.seborrhoeic dermatitis	02	13.33%

From the above table it's depicted that, the respiratory system was the most frequent system involved by opportunistic infections and accounted for 56% (n=56) of the total cases and clinically consolidation was the most frequent presentation accounting for 78.57% (n=44) of the total respiratory cases. This was followed in sequence by central nervous system involvement (26%) n= 26, cardiovascular system (06%) n=06 genitals (10%) n=10, skin (15%) n=15, and abdomen in 05 %(n=05) of the total cases.

TABLE 19

Important Supportive Investigations

Investigations	No. of cases (n)	Percent of cases
Hemoglobin		
a) </=8 gm%	46	46%
b) >8 gm%	54	54%
Sputum positivity	14	14%
a)sputum AFB +	08	30.77%
b)sputum PCP +	04	15.14%
c)sputum for pyogenic organisms	02	7.69%
Stool positivity	15	15%
a)cysts of cryptosporidium	07	46.67%
b)larvae of Strongyloides	03	20%
c)cysts of Microspora	00	00%
d)cysts of Isospora	05	33.33%
CSF positivity	19	19%
a) suggests TBM	10	52.63%
b) Suggests cryptococcal	09	47.36%

meningitis Suggests pyogenic meningitis	00	00%
Oral swab positive for pseudohyphae	48	48%
Ascitic fluid positive for tuberculosis	02	02%
Pleural fluid positive for tuberculosis	06	06%
FNAC a)suggests tuberculous adenitis b)reactive hyperplasia	13 12 01	13% 92.31% 07.69%
Fundoscopy a) suggests papilloedema b) suggests CMV retinitis	26 23 03	26% 88.46% 11.54%
2D Echocardiography suggests effusion	05	05%
Upper GI endoscopy suggests Candida	04	04%

Serology	07	07%
a)positive for Toxoplasma	04	57.14%
b)positive for CMV	03	42.86%
X ray suggests	62	62%
a)miliary shadows	10	16.13%
b)consolidation/ infiltration	39	62.90%
c)pleural effusion	06	9.68%
d)pericardial effusion	02	3.26%
e)fibrosis	04	6.45%
f)cavity	01	1.63%
CT Scan positivity	26	26%
a) suggests TBM	07	26.92%
b) suggests tuberculoma	03	11.54%
c) suggests cryptococcal meningitis	09	34.62%
d) suggests Toxoplasma	04	15.38%
e) suggests PML	03	11.54%
Ultrasound positivity	21	21%
a)suggests intra abdominal		

Lymphadenopathy	11	52.38%
b)suggests splenic abscesses	08	38.09%
c)mediastinal lymph nodes	02	9.53%

TABLE 20

CD4 T-Cells variability

CD4+ Cell ranges	No. of cases (n)	Percent of cases
>500/ microlitre	Nil	00%
200-499/ microlitre	35	35%
<200/ microlitre	65	65%
Total	100	100%

This table depicts that 65% (n=65) of the patients with opportunistic infections had CD4+ T-Cell counts below 200/microlitre, where as there were none (n= 0) with counts above 500/microlitre.

TABLE 21

Mean CD4+ T cell in various opportunistic infections

Opportunistic infections	Mean CD4+ cell count
Tuberculosis	217.72/ micro L
Candidiasis	190.07/ micro L
Cryptococcosis	072.89/ micro L
Pneumocystosis	145.73/ micro L
Cryptosporidiosis	212.00/ micro L
Isosporiasis	241.80/ micro L
Strongyloidiasis	274.00/ micro L
Toxoplasmosis	063.75/ micro L
Cytomegalosis	019.66 / micro L
PML	018.33 / micro L

The table above shows that the mean CD 4 + cell count in tuberculosis was 217. 72 / micro L and in candidiasis 190.07/ micro L. the low values were observed in PML (18.33/ micro L), CMV (19.66/ micro L) and in toxoplasmosis (63.75/ micro L).

TABLE 22

Frequency of various opportunistic infections

Opportunistic infections	No. of cases	Percent of cases
Tuberculosis	50	50%
Candidiasis	49	49%
Pneumocystosis	16	16%
Cryptococcosis	09	09%
Cryptosporidiosis	07	07%
Strongyloidiasis	03	03%
Isosporiasis	05	05%
Toxoplasmosis	04	04%
CMV retinitis	03	03%
PML	03	03%
Herpes	06	06%
Molluscum contagiosum	06	06%
Pneumococci	02	02%
Scabies	03	03%
Sebhorrheic dermatitis	02	02%

It is evident from the table above that tuberculosis is the most frequent opportunistic infections accounting for 50 %(n= 50) of all opportunistic infections, followed by candidiasis in 49% (n=49) of cases.

TABLE 23

Clinical profile of common opportunistic pathogens

A) TUBERCULOSIS (n= 50)

Clinical profile	No. of cases	Percent of cases
Only pulmonary	16	32%
Extrapulmonary	07	14%
Both	27	54%

Among the extra pulmonary tuberculosis, the frequencies of various manifestations are as follows-

Manifestations	No. of cases(n=34)	Percent of cases
Meningitis /tuberculoma	10	29.41%
Lymphadenitis	12	35.29%
Pleural effusion	06	17.65%
Pericardial effusion	05	14.71%
Ascitis	02	05.88%

The above table depicts that the most frequent manifestation of tuberculosis was combined pulmonary and extra pulmonary and in the present study accounted for 54 %(n=27) of the total cases. The most frequent extra pulmonary manifestation in the present study was tubercular lymphadenitis accounting for 35.29% (n=12) of all extra pulmonary manifestations followed by tubercular meningitis in 29.41% (n=10) of such cases. The remaining are accounted for by pleural effusion (17.65%) n=06, pericardial effusion (14.71%) n=05 and by ascitis (5.88%) n=02.

B) CANDIDA (n=49)

Manifestations	No. of cases	Percent of cases
Oropharyngeal	48	97.96%
Esophageal	04	8.16%
Vulvovaginal	03	6.12%

The table shows that in 97.96% of the cases Candida involved oropharynx (n=48), which was its most frequently occurring clinical profile. Candida involved esophagus and vulva –vagina in 8.16 %(n=4) and 6.12% (n=03) of the cases respectively.

C) OTHERS

Opportunistic pathogens	Clinical profile	No. of cases (n)	Percent of cases
Pneumocystis	pneumonia	16	100%
Cryptosporidium	diarrhoea	07	100%
Isospora	diarrhoea	05	100%
Strongyloides	diarrhoea	03	100%
Cryptococci	meningitis	09	100%
Toxoplasma	Focal neuro deficit and convulsions	04	100%
JC Virus	Focal neuro deficit and convulsions	03	100%
CMV	Visual blurring	03	100%
Pneumococci	pneumonia	02	100%

TABLE 24

Clinical profile of respiratory system manifestations (n=56)

Manifestations	No. of cases	Opportunistic pathogens	percent
Pneumonia	44(78.57%)	Tuberculosis (n= 26) Pneumocystis (n=16) Pneumococci (n= 2)	59.09% 36.36% 4.55%
Pleural effusion	06(10.71%)	Tuberculosis (n=06)	100%
Cavity	01(1.78%)	Tuberculosis (n=01)	100%
Fibrosis	05(8.92%)	Tuberculosis (n=05)	100%

From the above table it is clear that the most common manifestation of opportunistic infections in respiratory system in the present study was pneumonia accounting for 44 cases of which tuberculosis(n=26) was the most frequent opportunistic pathogen accounting for 59.09% of cases and Pneumocystis in 36.36%(n=16). All the cases of pleural effusion, fibrosis and cavity were attributable to tuberculosis.

TABLE 25

Clinical profile of cardiovascular system manifestations (n=05)

Manifestation	No. of cases	Opportunistic infections	percent
Pericardial effusion	05(100%)	Tuberculosis	100%

In the present study, pericardial effusion was found to be the only manifestation of cardiovascular system and all such cases were accounted for by tuberculosis (100%) n =05.

TABLE 26

Clinical profile of central nervous system manifestations (n=26)

Manifestations	No. of cases	Opportunistic infections	percent
Altered sensorium	18	Cryptococci (8) Tuberculosis (7) PML (3)	44.44% 38.88% 16.66%
Convulsions	20	Tuberculosis (9) Cryptococci (7) Toxoplasma (4)	45% 35% 20%
Focal neuro deficit	07	Toxoplasma(4) PML (3)	57.15% 42.85%
Meningitis	19	Tuberculosis (10) Cryptococci (9)	52.63% 47.37%

The table above shows that convulsions were seen in 20 cases and were mostly accounted for by tuberculosis in 45% (n=9) of the cases and by Cryptococci in 35 %(n=7) and by Toxoplasma in 20 %(n= 4) of the cases. 18 cases had presented with altered level of senses of which 44.4% of the cases were attributable to Cryptococci (n=8) and 38.88% of the cases were because of tuberculosis (n=7). Of the 19 cases diagnosed to be having meningitis 52.63% had tubercular (n=10) and 47.37% had cryptococcal origin (n=9). 4 out of 7 cases of FND were because of Toxoplasma (57. 15 %) and rest were due to PML (n=3).

TABLE 27

Clinical profile of gastrointestinal tract manifestations

Manifestations	No. of cases (n)	Opportunistic pathogens	percent
Dysphagia	47	Candida	100%
Diarrhoea	15	Cryptosporidium(07) Isospora (05) Strongyloides (03)	46.67% 33.33% 20%

All the 100% cases of dysphagia were attributable to candidiasis (n=47). Of the diarrhoeal diseases most of the cases were Cryptosporidial (46.67%) n= 07, followed by Isosporiasis (33.33%) n= 05 and in 20% of the cases it was due to Strongyloidiasis (n=03)

TABLE 28

Clinical profile of dermatologic manifestations (n=15)

Manifestations	Total cases (n)	percent
Herpes zoster	04	04%
Molluscum contagiosum	06	06%
Scabies	03	03%
Sebhorrheic dermatitis	02	02%

In the present study herpes and molluscum contagiosum accounted for 06% (n=06) cases herpes zoster 04% (n=04), Sebhorrheic dermatitis was seen in 02% (n= 02) cases.

TABLE 29

Clinical profile of the genital 3 lesions (n=10)

Manifestation	No. of cases (n)	percentage
Herpes genitalis	7	70%
Vulvovaginal candidiasis	3	30%

In the present study herpes genitalis was found to be the most frequent genital lesions accounting for 30% (n=3).

DISCUSSION

AGE DISTRIBUTION OF CASES

Garcia Ordonez MA et al (73) in his study found that the mean age (SD) was 33.2 (18.3), with 88% being less than 55 years old. **N. Usha Rani et al (103)** studied 120 patients with HIV infection and she found that out of 23 HIV positive cases 11 (47%) belonged to the age group of 21-30 years. In the present study majority of the patients (55%) were in the age group of 30-39 years and 94% of the patients fell below the age of 50 years comparable to results of **Garcia Ordonez MA et al.** So it was observed that the frequency of opportunistic infections was highest in the sexually active age group of the society. This indicates a trend of young and productive generation being affected; a reflection of the devastating effects India will face as the younger generation work force is affected.

EXTRAMARITAL AFFAIR STATUS

In the present study it was found that most of the patients who were married or separated had multiple extramarital sexual partners and accounted for 53.25%. **Eknath Naik et al (115)** in their study reported regarding sexual practices of the cases and found that 35% of the

respondents had extramarital sexual encounters, with more males than females reporting extramarital affairs. This points that with the spread of immorality the incidence of HIV is at a rise.

OCCUPATIONS

Malta M et al (92) found that truck drivers typically had unprotected sex with several partners, including CSWs and truck stop employees.

N. Usha Rani et al (103) in their study had found that 40% of the cases were truckers or manual labourers and all males gave a history of promiscuous behaviour and casual sex.

In the **present study 43**% of the patients were labourers and 12% of the cases were drivers. CSWs accounted for only 4% of the total cases. Therefore these are the occupations where the individuals are typically at risk of unprotected sex and hence are at high risk of acquiring HIV infections.

MODES OF TRANSMISSION

Patel AK et al (95) in their study found that the modes of transmission were sexual route 18 (58.07%) patients {Heterosexual 17 (54.84%), Homosexual 1 (3.23%)}, Parenteral route 13 (41.94%) patients (Blood

transfusion 13 (41.94). in their study no cases could be attributed to I.V. drug abuse, infected needle injury, and vertical transmission.

Uzgare R et al (102) found the percentage of various modes of transmission as sexual route: 93.02%, blood: 2.32%, perinatal: 2.32%, surgery/IV needles: 3.72%. Out of 40 females 37 (92.5%) got HIV infection from their husbands and 2 had the infection from blood transfusion.

Kothari K et al (104) showed that the sexual mode of transmission was present in 21 subjects (70%) (20 males and one female), of which 18 were heterosexual and three bisexual. Four patients (13%) had history of blood transfusion.

M Korzeniewska-Kosela et al (67) in their study found that 30 (75%) were heterosexual, 6 (15%) were homosexual and used intravenous drugs, 2 (5%) just used intravenous drugs, and 1 (2%) had heterosexual contact with prostitutes; for the remaining subject the risk factor for HIV infection was not established.

In the **present study** it was found that the heterosexual mode of transmission was the most common mode of transmission, accounting for 94 % of the cases. 1% was due to homosexual mode of transmission and 3% were attributable to blood/blood product related transfusion and 2%

by materno-fetal transmissions .In the present study, no cases could be attributed to IV drug abuse and Needle stick.

A summary chart of the comparison is given below:

Modes	**Patel AK et al**	**Alrajhi Abdulrahman A et al**	**Present study**
Heterosexual	54.84%	46%	94%
Homosexual	03.23%	05%	01%
Transfusion	41.94%	26%	03%
IV drugs	00%	02%	00%
Needle stick	00%	00%	00%
Vertical	00%	12%	02%

In all the study it was evident that heterosexual route of transmission was the commonest mode of transmission and the present study was comparable to the study of **Patel AK et al** as far as the modes of transmission is concerned.

LEVEL OF EDUCATION

In his study **Eknath Naik et al (115)** revealed that only 22% of adults had even heard of AIDS, and 18 % knew how it is transmitted. In addition, only 5% knew that STDs and AIDS were related to each other. AIDS awareness among women was lower compared to men (14% vs.30 %).

In the **present study** the incidence of opportunistic infections was significantly high (55%) in patients who were less educated (<10th) whereas it was mere 11% in those who were highly educated. This directly indicates the impact of the level of education on the transmission of the disease, as education is directly related to the level of awareness.

CLINICAL SYMPTOMATOLOGY OF OPPORTUNISTIC INFECTIONS

M Korzeniewska-Kosela et al (67) in their study found that symptoms at presentation included weight loss (in 80% of the cases), fever (in 75%), cough (in 70%) and night sweats (in 55%).

Patel AK et al (95) in their study noticed that the common modes of presentation were fever more than 1 month (80.65%) weight loss more

than 10% of body weight (77.42%) and Diarrhoea more than 1 month (41.94%).

Kothari K et al (104) in their study found that the commonest presentation was fever in ninety six per cent. Significant weight loss (1.5%+/-9.76%) was present in patients having associated Candida infection.

In the **present study** it was found that loss of appetite was the most frequently occurring symptom present in 76% of the cases. Fever was present in 73% cases and 69% of the cases were febrile for >1 month duration. weight loss in 71 %(46% had weight loss >10%), cough in 55 %(53% had those > 1month duration) and diarrhoea in 15% (all more than 1 month duration) of the cases were evident from the present study. Hence, in the present study also there were high incidences of patients presenting with fever, cough, weight loss and diarrhoea.

ASSOCIATED HISTORY OF DRUG ADDICTION

Malta M et al (92) had concluded from their study that the use of alcohol and amphetamine-like drugs were frequent among truckers and appeared to influence unsafe sex practices.

In the **present study** it was seen that in 33 % of the cases there was history of multiple addictions whereas in 19 % of the cases there was history of addiction to alcohol.

Therefore it is evident that addiction to multiple substances of abuse and alcohol has a direct influence on the unsafe sexual practice.

FREQUENCY OF VARIOUS OPPORTUNISTIC INFECTIONS

SK Sharma et al (5) in their study found that tuberculosis (TB) was the commonest opportunistic infection (71%) followed by candidiasis (39.3%), Pneumocystis jiroveci pneumonia (7.4%), cryptococcal meningitis and cerebral toxoplasmosis (3.7%)

Patel AK et al (95) in their study have found various opportunistic infections as Oropharyngeal candidiasis (41.94%), Pulmonary and extra Pulmonary tuberculosis (25.81%), Recurrent Pyogenic infections (12.90%), generalized lymphadenopathy (12.90%), Pneumocystis Carinii pneumonia (12.90%). AIDS Dementia Complex, (9.68%) and Recurrent Herpes Zoster (9.68%).

Giri TK et al (97) showed that among the symptomatic patients, oropharyngeal candidiasis was the most common opportunistic infection followed closely by tuberculosis (both pulmonary and extra pulmonary).

Infection with Cryptococcosis, Cryptosporidiosis and Cytomegalovirus occurred only after a significant fall in CD4 to < 100/cmm. Pneumocystis carinii pneumonia was the terminal event among the 12 deaths at a mean CD4 count of 6/cmm.

Singh A et al (6) conferred from their study that Oral candidiasis (59.00%) was found to be the most common opportunistic infection, followed by tuberculosis (56.00%), Cryptosporidium infection (47.00%) and Pneumocystis carinii (7.00%).

M. Vajpayee et al (107) in their study found that the predominant opportunistic infections were tuberculosis (47%, 189 cells/µl), followed by parasitic diarrhea (43.5%, 227 cells/µl) and oral candidiasis (25.2%, 189 cells/µl).They concluded that tuberculosis was the most frequent OI in the HIV-infected patients studied.

In **the present study** it was found that tuberculosis was the most frequent opportunistic infections accounting for 50% of all opportunistic infections, followed by candidiasis in 49% of cases. Pneumocystosis was seen in 16%, Cryptococcal infection in 09% and parasitic diarrhoea in 15%.

CLINICAL PROFILE OF TUBERCULOSIS

Quinhoes E P et al (65) found that TB of any organ was diagnosed in 41% (45/110) of HIV+ and in 3% (4/135) of HIV- patients. Of 33 HIV+ patients with pulmonary TB, non-cavitary findings were reported in 28 (90%) of 31 with x-rays, while among 3 HIV- patients with pulmonary TB, 2 (67%) had a non-cavitary appearance .Extrapulmonary infections occurred in 23 (51%) of the 45 HIV+ TB patients. Extrapulmonary sites involved in the 23 HIV+ TB patients were lymph nodes in 15 patients (65.21%), disseminated 9 patients(39.13), pleura 3(13.04%), pericardium 2(8.69%), meninges 2(8.69%), liver 1(4.34%), and spleen 1(4.34%) They didn't find any case of atypical TB.

Garcia Ordonez MA et al (73) in their study of 138 tuberculosis patients found that thirty six patients (26.1%) were HIV-infected. Extrapulmonary tuberculosis made up 27.5% of the cases, and was more frequent in HIV-infected patients in their study.

Robles P et al (79) found that the clinical forms of TB observed in their study were pulmonary (52.5%), generalized (17.8%), pleural (11.8%), lymphatic (8%), genitourinary (7.5%), osteoarticular (4%), meningeal (1.8%) and others (4.6%). Overall 25.5% of patients with TB were co infected.

V S S Attili et al (114) in their study found that tuberculosis was the commonest opportunistic disease, seen in 163 patients. Of these, 68 had exclusively pulmonary tuberculosis (41.72%), 55 extra pulmonary disease (33.74%), and 40 the disseminated form (24.54%). And they concluded that pulmonary and extra pulmonary forms of tuberculosis should be considered in AIDS defining illness.

Rajendraprasad S. et al (112) showed that among the pulmonary manifestations, 22 (43%) were sputum positive and 33 (57%) sputum negative. In the **present study** the sputum AFB positivity was seen in 30.77% of the tuberculosis cases. Hence, it is evident that in HIV patients' sputum is negative for AFB most of the times.

A chart depicting the comparison of extra pulmonary manifestations in some studies is as below:

Extrapulmonary manifestations	Rajendraprasad S. et al	Robles P et al	Quinhoes E P et al	Present study
Pleural effusion	45%	11.8%	13.04%	17.65%
Lymphadenitis(including abdominal)	54%	08%	65.21%	35.29%
Pericardial effusion	-	-	08.69%	14.71%
Meningitis	2.81%	1.8%	08.69%	29.41%
Ascitis	-	-	-	05.88%
Osteoarticular	-	04%	-	-
Liver, spleen	-		8.69%	-
Genitourinary	-	7.5%	-	-
Disseminated	-	17.8%	39.13%	-

The present study like most other studies showed the predominance of tubercular lymphadenitis as the most common extra pulmonary manifestation.

CLINICAL PROFILE OF CANDIDIASIS

Richard D. Moore et al (93) in his study found that most common opportunistic disease was Candida esophagitis.

Maurizio Ravera et al (75) found that most (90.8%) (42 female, 35 male, mean age 28.0 ± 5.8 years) of the study participants had both oral and esophageal candidiasis. Forty (47.1%) had esophageal symptoms, and all had esophageal candidiasis at endoscopy.Also more than half (51.9%) of 77 patients with esophageal candidiasis also had esophageal symptoms

In the **present study** oropharyngeal candidiasis was present in 97.96%, vulvovaginal candidiasis in 6.12% and esophageal candidiasis 8.16%, dysphagia was seen in 48% of the cases. In comparison to other studies vulvovaginal candidiasis was a feature noted in the present study.

CLINICAL PROFILE OF DIARRHOEAL DISEASE

César Cárcamo et al (87) found that Cryptosporidium species was the most frequent pathogen and Giardia lamblia, Aeromonas species, Campylobacter species, and rotavirus were all significantly associated with diarrhea. Bacterial pathogens were significantly associated with G. lamblia and rotavirus infection. Of the bacterial pathogens Aeromonas, Campylobacter, Salmonella, and Vibrio species and enterotoxigenic Escherichia coli were common.

Guk SM et al (89) in their study studied the prevalence of the parasitic infections in 105 HIV-infected patients and found that the percentage of

various opportunistic pathogens were-Cryptosporidium parvum (10.5%; 7/67), Isospora belli (7.5%; 5/67), Clonorchis sinensis (3.0%; 2/67), Giardia lamblia (1.5%; 1/67), Gymnophalloides seoi (1.5%; 1/67), and Pneumocystis carinii (28.3%; 17/60).

Comparison:

Opportunistic pathogens	**Guk SM et al**	**Present study**
Cryptosporidium	10.5%	46.67%
Isospora	07.5%	33.33%
Strongyloides	-	20%
Clonorchis sinensis	03.0%	-
Giardia	01.5%	-
Gymnophalloides	01.5%	-
Pneumocystis	28.3%	-

The present study differed from that of **Guk SM et al** in that cryptosporidium was the commonest opportunistic pathogen causing diarrhoea and that there was 20% cases of Strongyloides in the present study which was not seen in **Guk SM et al.**

CLINICAL PROFILE OF CENTRAL NERVOUS SYSTEM INFECTIONS

P .Satishchandra et al (101) found that Cryptococcal meningitis either alone (n-31) or associated with TB meningitis (n-6) was the most common (46.3 %) followed by neuro tuberculosis either alone (n-24) or with cerebral Toxoplasmosis (n-4) accounted for 35 %. Other opportunistic neuroinfections included Herpes zoster, pyogenic meningitis and neurosyphilis.

C. M. Schutte et al (82) in their study found that TB meningitis occurred in 16 (36%), cryptococcal meningitis in 22 (50%) and acute bacterial meningitis in 3 (7%). In the first 2 years of the study the spectrum of meningitis changed: bacterial meningitis remained relatively stable at about 25% of the total; TB meningitis almost doubled from 16% in the 1st year to 31% in the last year of the study; viral meningitis initially occurred in 8% of patients and later in 3% of cases, while cryptococcal meningitis showed the most significant increase from 6% of cases to 31 and 26% respectively in the last 2 years of the study.

In the **present study** convulsions were seen in 20 cases and were mostly accounted for by tuberculosis in 45% of the cases, by Cryptococci in 35% and by Toxoplasma in 4% of the cases. 18 cases had presented with

altered level of senses of which 44.4% of the cases were attributable to Cryptococci and 38.88% of the cases were because of tuberculosis. Of the 19 cases diagnosed to be having meningitis 52.63% had tubercular and 47.37% had Cryptococcal origin. 4 out of 7 cases of FND were because of Toxoplasma and rest was due to PML. So tuberculous meningitis is the most common central nervous system opportunistic infection seen in the HIV.

CLINICAL PROFILE OF OPHTHALMIC INFECTIONS

In the **present study**, there were 3 cases of Cytomegalovirus retinitis, which accounted for the only ophthalmic opportunistic infections.

Biswas Jyotirmay et al (100) concluded from their study that ocular lesions in HIV patients in India are less common than those in western world and unlike HIV patients in USA, the most common ocular lesion among HIV patients in India is CMV retinitis and not the cotton wool spots. Hence it's conclusive from the present study that CMV retinitis is the most frequent opportunistic infections affecting the eyes.

CLINICAL PROFILE OF PNEUMOCYSTIS

N. Usha Rani et al (103) studied 23 patients of PCP and found on clinical examination of the respiratory system that in a majority it was normal, some showed fine basal crackles with or with out rhonchi. %. Chest X-ray examination showed that 73% had bilateral lower zone or mid and lower zone interstitial shadows and 18% had interstitial and alveolar shadows. . Pneumocystis Carinii cysts were demonstrated in 1 out of 6 (16%) cases by Giemsa staining.

Udwadia Z. F et al (110) concluded that PCP is not an uncommon infection in Indians with advanced HIV and that PCP was the second commonest pulmonary disease after tuberculosis accounting for 32% of pulmonary admissions and 13 % of all HIV positive admissions.

In the **present study** Pneumocystosis occurred in 16% of the cases and ranked the third in order of frequency of opportunistic infections. It accounted for 38.1% of the cases of pneumonia second only to tuberculosis. All the cases included in the study were positive for the staining for PCP and the X- xay showed perihilar consolidation.

SPECTRUM OF RESPIRATORY OPPORTUNISTIC INFECTIONS

In the **present study** the most common manifestation of opportunistic infections in respiratory system was pneumonia accounting for 44 cases of which tuberculosis was the most frequent opportunistic pathogen accounting for 59.09% of cases and Pneumocystis in 36.36%. All the cases of pleural effusion, fibrosis and cavity were attributable to tuberculosis.

Sanjeev Sinha et al (109) in their study spectrum of pulmonary infections in HIV positive patients was as follows; pulmonary tuberculosis in 40, bacterial pneumonia in 16, fungal infections in 15, Pneumocystis carinii were positive in 5 .In the X- ray findings the following findings were found- miliary shadows 16.13%, consolidation/ infiltration 62.90%, pleural effusion 9.68%, pericardial effusion 3.26%, fibrosis 6.45% cavity 1.63%.

Sanjeev Sinha et al (109) also showed in their study the following .radiological findings-Pleural effusion in 21, military mottling in 16, hilar lymph nodes in 19, consolidation in 11, alveolar shadows in 10 and calcified lesions in 8 patients.

ASSOCIATED HISTORY OF STDS

Ponniah P et al (94) in their study had found that out of 919 cases studied, STD and associated diseases were seen in 340 cases with past STDs accounting for 88; multiple STD for 56; GUD for 87; Warts for 19; Syphilis for 69; Granuloma inguinale for 8 .

In the **present study** associated history of STDs was present in 21% of the cases, showing the presence of the common risk factors for both.

CD4+ CORRELATION OF OPPORTUNISTIC INFECTIONS

M Korzeniewska-Kosela et al (67) found in their study that the mean CD4 lymphocyte count was 0.2 x 10(9)/L(i.e. 200/ micro L) in patients with tuberculosis.

Patel AK et al (95) found in their study that 93% of the cases had CD4 cell count less than 200/mm 3**.** In the present study 65% of the patients were having the same range of counts.

M Whiteman et al (69) found in their study that the mean CD4 count was 162/mm3 in patients with tuberculosis.

Giri TK et al (97) in their study that oropharyngeal candidiasis and tuberculosis (both pulmonary and extra pulmonary) had a median CD4 of 420-578 per cmm. Infection with Cryptococcosis, Cryptosporidiosis and

cytomegalovirus had a mean CD4 to < 100/cmm. Pneumocystis carinii occurred at CD4 count of 6/cmm.

Myoung-don Oh et al (74) detected that CD4+ lymphocyte counts at presentation were <200/micro L in 27% of the patients with opportunistic infections

SK Sharma et al (5) found that majority of the patients 82.6% had CD4+ counts <200 cells/µL. 46% had CD4+ counts <50 cells/µL.

M. Vajpayee et al (107) in their study that the mean CD4+ counts were- tuberculosis 189 cells/µl, followed by parasitic diarrhea 227 cells/µl and oral candidiasis 189 cells/µl.

In the **present study** the mean CD4 counts were Tuberculosis 217.72/ micro L , Candidiasis 190.07/ micro L, Cryptococcosis 072.89/ micro L, Pneumocystosis 145.73/ micro L and in parasitic diarrhoea 242.6/ micro L .So the results of this study was comparable to that of **M. Vajpayee et al .**

WHO CLASSIFICATION OF THE PATIENTS .

In the **present study** 65% patients opportunistic infections were in had CD4+ count between 200-499 /micro liter and 35% had it below 200/microlitre and no patients were there who had counts above 500/microlitre.Thus 65% patient were belonging to WHO Stage B and 35% in Stage B. No patients were seen in Stage A. **(17)**

Summary & Conclusions

In this study population, the males were (74%) as compared to females (26%). The male to female ratio was 2.84:1.

The present study revealed that the maximum number of patients who had opportunistic infections were in the age group of 30- 39 yrs (55%), followed by the age group 20-29 yrs (21%).Thus , it favours the occurrence of the disease in the sexually active youth.

Maximum number of HIV positivity with opportunistic infections were seen in the married group (65 %), followed by people who were unmarried (23%) and least in those who were separated (12%).

Regarding the occupation, most of the occupants, who harboured opportunistic infections were labourer (43%) followed by housewives (18%). Drivers accounted for 12% and school going children for only 3% of the total case.

The heterosexual mode of transmission was the most common mode of transmission, accounting for 94 % of the cases.

The disease showed more frequency in the less educated population .The frequency of opportunistic infections was significantly high (55%) in patients who were less educated (<10th standard).

In the present study, the most common symptoms at presentation were loss of appetite (76%), fever (73%), weight loss (71%), cough (55%) whereas diarrhea was seen in only 15 % of the cases. Most of the patients with opportunistic infections at presentation had weight loss more than 10 % of their body weight (46%). Those who had diarrhoea at presentation, mostly had a duration of >1 month (15%). Most of the patients who were febrile at presentation had history of fever mostly for more than 1 month duration (69 %).

Associated history of Tuberculosis was present in 28% of the cases followed by that of STDs in 21% of cases in the present study.

Regarding addiction to the substance of abuse, in 33 % of the cases there was history of multiple addictions, whereas in 19 % of the cases there was history of addiction to alcohol and in 15 % of the cases addiction to tobacco was seen.

In the present study, 19 % of the patients had history of HIV positivity in their spouse.

In the present study, the common findings on general examination were tachycardia (94%), pallor (76%). and emaciation (73%).

It was found that the respiratory system was the most frequent system involved by opportunistic infections and accounted for 51% of the total cases .Clinically consolidation was the most frequent presentation accounting for 82.35% of the total respiratory cases. This was followed in sequence by central nervous system involvement (25%), cardiovascular system (11%), genitals (10%), skin (08%) and abdomen (05%) of the total cases.

Most of the patients with opportunistic infections had CD4+ T-Cell counts below 200/microlitre, where as there were no patients in the study, with counts above 500/microlitre.

The mean CD4 counts in a few opportunistic infections were Tuberculosis 217.72/ micro L, Candidiasis 190.07/ micro L, Cryptococcosis 072.89/ micro L, Pneumocystosis 145.73/ micro L.

In the present study, Tuberculosis was the most frequent opportunistic infections accounting for 50% of all opportunistic infections, followed by Candidiasis in 49% of cases. The most frequent manifestation of tuberculosis was combined pulmonary and extra pulmonary and in the present study accounted for 54% of the total cases. The most frequent extra pulmonary manifestation in the present study was tubercular lymphadenitis accounting for 35.29% of all extra pulmonary manifestations. 97.96% of the cases Candida involved oropharynx, which was its most frequently occurring clinical profile.

The most common manifestation of opportunistic infections in respiratory system in the present study was pneumonia accounting for 44 cases of which tuberculosis was the most frequent opportunistic pathogen accounting for 59.09% of cases and Pneumocystis in 36.36%.

Pericardial effusion was found to be the only manifestation of opportunistic infections in cardiovascular system.

Convulsions were seen in 20 cases and were mostly accounted for by tuberculosis that is in 45% of the cases and by Cryptococci in 35% and by Toxoplasma in 4% of the cases. 18 cases had presented with altered

sensorium of which 44.4% of the cases were attributable to Cryptococci and 38.88% of the cases were because of Tuberculosis.

In those having meningitis 52.63% had tubercular and 47.37% had cryptococcal origin.

All the 100% cases of dysphagia were attributable to candidiasis.

Regarding, diarrhoeal diseases most frequent causes were Cryptosporidial (46.67%), followed by Isosporiasis (33.33%) an in 20% of the cases it was due to Strongyloidiasis.

Among the dermatologic manifestation herpes 06%, molluscum contagiosum 06%, scabies 03% Sebhorrheic dermatitis accounted for 02%.

1. The incidence of opportunistic infections is higher in males as compared to females.
2. HIV with opportunistic infections is the disease of youth and is prevalent in those who are sexually active..
3. The heterosexual mode of transmission is the most common mode of transmission in India, as compared to the prevalence of homosexuality in the western world.
4. In our set up most frequent opportunistic infections are accounted by tuberculosis and candidiasis
5. There is a direct correlation between the values of CD4 count and the severity of the opportunistic infections, hence indicating the level of immunity and the severity of the disease.

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PROFORMA

Name

Age

Sex

IP/ART no.

Address

Ward no-

Marital status- married /single /separated

Occupation –labourer/driver/service/business/ commercial sex workers (CSWs)/housewives.

Exposure type-homosexual /heterosexual/ I.V .drug abusers /blood or blood product transfusion /needle prick.

Education- <10th/upto 12th /higher education

Presenting complaints – yes/ no- duration

1. Fever
2. Weight loss
3. Chronic diarrhoea
4. Cough
5. Loss of appetite

6. Dysphagia
7. Dyspnoea /tachypnoea
8. Genital ulcer
9. Swelling over body
10. Rash
11. Headache
12. Convulsions
13. Altered sensorium
14. Abdominal pain
15. Abdominal distension
16. Chest pain
17. Visual blurring
18. Vomiting

Past history- yes /no

1. Sexually transmitted diseases
2. Tuberculosis
3. Diabetes
4. Hematological malignancies and disorders
5. Chronic Renal Failure

6. Connective Tissue Disorders

Personal history –yes /no

1. addiction to tobacco ,alcohol, substance of abuse
2. professional blood donors

Obstetric history in female patients

Family history- h/o recent contact with TB patient.

Clinical examination

1. Built
2. Nutrition
3. Weight
4. Temperature
5. Pulse
6. Respiratory rate
7. Blood pressure
8. Pallor
9. Icterus
10. Cyanosis
11. Clubbing
12. Edema feet

13. Lymphadenopathy- localized /generalized.
14. Genital examination-ulcers /vesicles /papules/ erosions/ warts
15. Oral cavity examination- thrush /aphthous ulcers
16. Skin examination- tinea /herpes and molluscum
17. Respiratory system examination
18. Cardiovascular examination
19. Per abdomen
20. Central nervous system examination

Probable clinical diagnosis-

Investigations

1. HIV ELISA
2. Hemoglobin
3. Peripheral smear
4. TLC
5. DLC- P L M E B others
6. ESR
7. CD 4 count
8. Urine

9. Sputum for microscopy ,gram and ZN stain, Giemsa stain ,culture
10. Throat /oral swab for culture microscopy
11. Stool for microscopy /culture
12. CSF –microscopy for TLC &DLC, India ink preparation, culture, biochemical examination for protein, sugar, chlorides.
13. Invasive procedures – FNAC / upper GI endoscopy
14. Radiological investigations – X- Ray , USG , CT- scan
15. Fundoscopy

K. Dis.No.10498/E4/1/2006.

Govt. Rajaji Hospital,
Madurai – 625 020. Dt. 11.09.06.

Sub: Establishment – Govt. Rajaji Hospital, Madurai – Ethical Committee Projects approved by the Committee – Intimation – Sent – Reg.

The Ethical Committee of the Govt. Rajaji Hospital, Madurai was held at 12.30 pm. on 11.09.2006 at the Dean's Chamber, Govt. Rajaji Hospital, Madurai, and the following Projects were approved unanimously by the Committee Members.

S.No.	Name of the Student	Name of the Project approved
01)	Dr.K.S.Thirupathy, PG in MD General Medicine.	Clinical Profile of Hypertrophic Cardiomyopathy.
02)	Dr.J. Balaji, PG in M.D.Paediatric Medicine.	FNAC of Childhood Lymphadenitis.
03)	Dr.C.Vipindas.C, PG in MD General Medicine	An Analysis of AIDS patients on Anti retroviral therapy.
04)	Dr. R. Sankar, PG in MD General Medicine.	Prevalence of HBsAg in close contacts of asymptomatic HBsAg carriers. Not approved.
05)	Dr. M. Subramania Adityan, PG in MD Dermatology	A study of clinical features, cytology, Histopathology and Immunofluorescence of autoimmune vesiculobullous diseases.
06)	Thiru S. Senthilkumar, Assistant Prof.of Radiology Physics.	Human tissue diagnosis under laser excitation.
07)	Dr.S.Gogularamanan & Dr.P.Kavitha, CRRIs, VII Medical Unit.	Neuronal networking to predict suicidal attempt.
08)	Dr.P.Kavitha, & Dr.S.Gogularamanan CRRIs, VII Medical Unit.	Presenting features of diabetics admitted in Medical ward.
09)	Dr. S. Rajarajeswari, MD,DGO., Prof. & HOD of Obst. & Gynaecology.	Low dose Magnesium Sulphate Regimen for management of eclampsia – A Randomized controlled Trial.

Please note that the investigator should adhere the following:-

01) She/He should get a detailed informed consent from the patients/participants and maintain confidentially.
02) She/He should carry out the work without detrimental to regular activities as well as without extra expenditure to the Institution or Government.
03) She/He should inform the Institution Ethical Committee in case of any change of study procedure site and investigation or guide.
04) She/He should not deviate for the area of the work for which applied for Ethical clearance.
05) She/He should inform the IEC immediately, in case of any adverse events or serious adverse reactions.
06) She/He should abide to the rules and regulations of the Institution.
07) She/He should complete the work within the specific period and apply for, if any extension of time is required, She should apply for permission again and do the work.
08) She/He should submit the summary of the work to the Ethical Committee on completion of the work.
09) She/He should not claim any funds from the Institution while doing the work or on completion.
10) She/He should understand that the members of IEC have the right to monitor the work with prior intimation.

Dean & Chairman,
Ethical Committee, Govt. Rajaji Hospital, Madurai.

To
The above applicants.

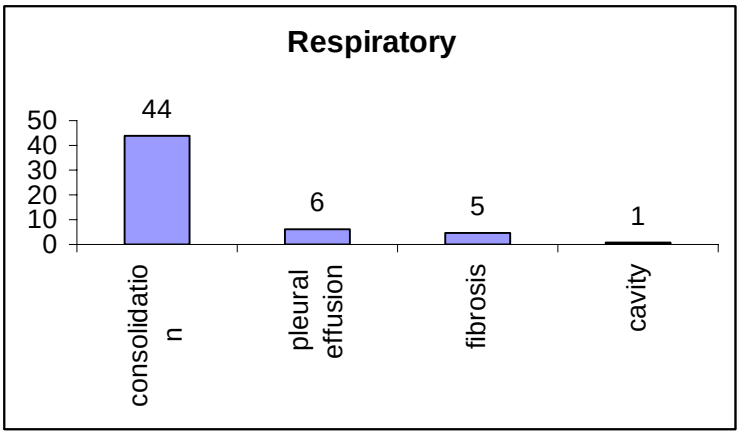
Forwarded
22/9

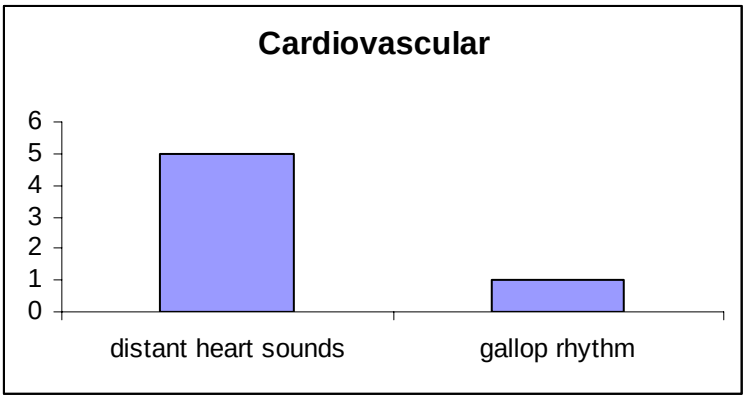
PROFESSOR AND HEAD
DEPARTMENT OF MEDICINE
MADURAI MEDICAL COLLEGE
MADURAI-625 020.

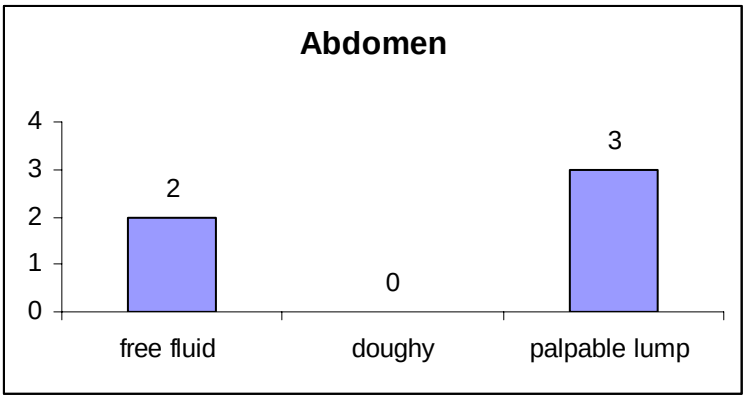
KEY TO MASTER CHART

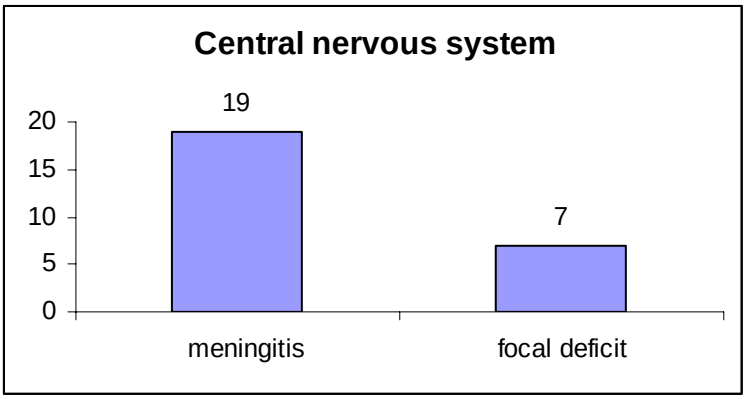
C	CANDIDA
M	MOLLUSCUM
H	HERPES
S	SCABIES
PN	PNEUMOCOCCI
CR	CRYPTOCOCCOSIS
AD	ADENITIS
IN	INFLTRATION
SA	SPLENIC ABSCESS
ML	MEDIASTINAL LNE
AL	ABD LNE
PL	PAPILLEDEMA
P/C	PCP/CANDIDA
C/C	CRCOCCOSIS/CANDIDA
SD	SEB.DERMATITIS
HW	HOUSE WIFE
CRS	CRYPTOSPORIDIOSIS
STR	STRONGYLOIDS
ISO	ISOSPORA
TOX	TOXOPLASMA
TUB	TUBERCULOMA
CSW	COMMERCIAL SEX WORKER
TBM	TUBERCULOUS MENINGITIS
CRS/C	CRYPTSPORIDIOSIS/CANDIDA
ISO/C	ISO/CANDIDA

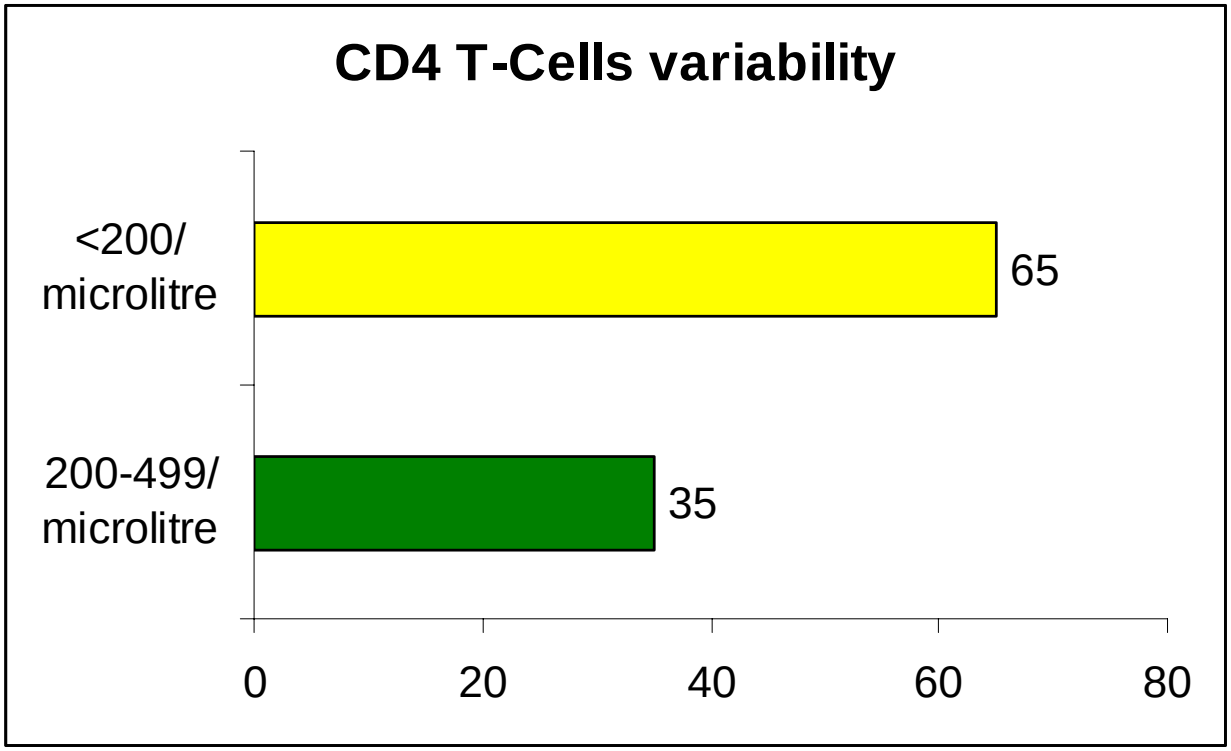
IMPORTANT SYSTEMIC EXAMINATION FINDINGS

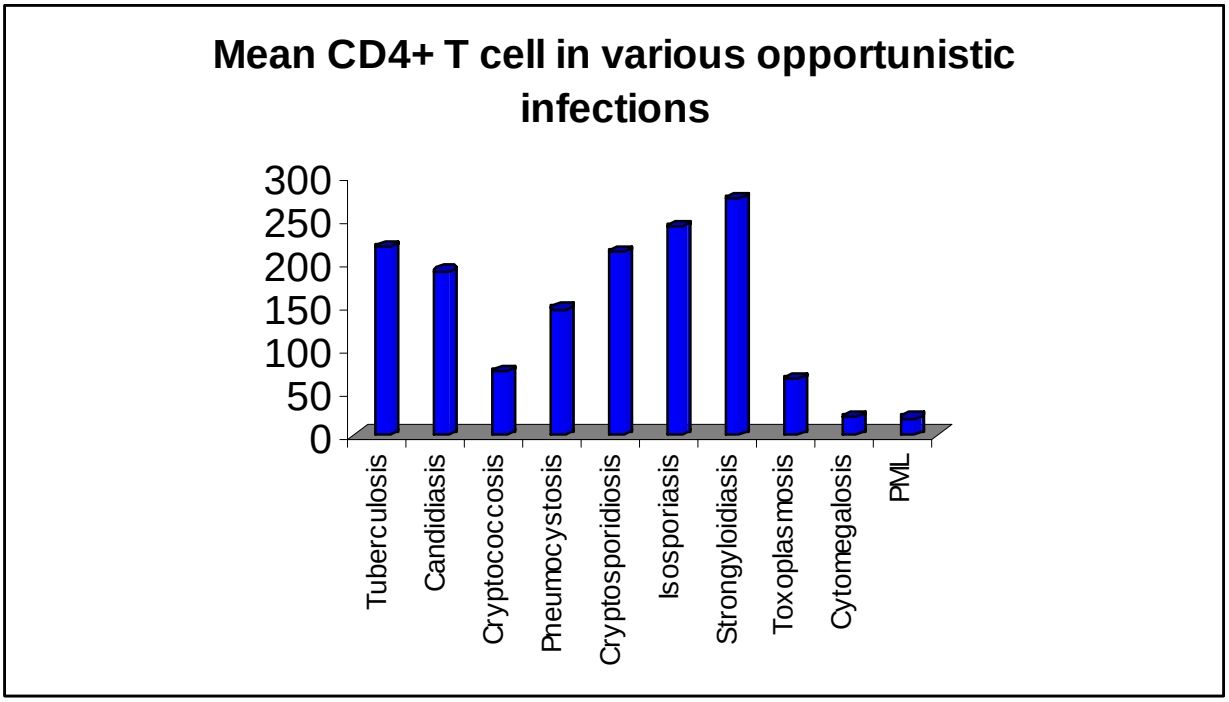









CD4 T-Cells variability
<200/ microlitre
65
200-499/ microlitre
35
0
20
40
60
80


Mean CD4+ T cell in various opportunistic infections
300
250
200
150
100
50
0
Tuberculosis
Candidiasis
Cryptococcosis
Pneumocystosis
Cryptosporidiosis
Isosporiasis
Strongyloidiasis
Toxoplasmosis
Cytomegalosis
PML